REMARKS

DRAWINGS

Applicant traverses the Examiner's objection to the drawings as failing to comply with 37 CFR 1.84 (p)(4).

Reference character 15 is objected to as having been used to designate both an EPROM and a serial link between Fig. 1a. Referring to the substitute specification translation (marked up copy) at page 1, line 18 the correct reference number for permanent memory is "13" as also shown at Fig. 1a and 1b. Applicant therefore corrects reference number "15" at page 1 line 18 of the specification translation to "13", since the objected reference number "15" clearly corresponds to a clerical error only.

Applicant respectfully traverses the Examiner's objection to the drawings under 37 CFR 1.84(p)(5). The following comments and revisions are noted.

- Reference character "13" in relation to Fig. 1a is now introduced at page 1, line 18 of the specification translation.

- Reference character "103" of Fig 2 is missing in the specification translation.

The specification translation at page 16, line 14 is corrected by adding reference character 103 for the "verification" step. Missing reference character 103 clearly comes from a clerical error since step 103a and step 103b clearly designate a successful and an unsuccessful response respectively to corresponding verification step, that should have been labeled "103" as shown at Fig. 2.

- Reference character "306" of Fig. 3d is missing in the specification translation.

The item "306" at page 25, line 10 is inserted between "stack" and "in" to read:

-the verification process reinitializes the type stack "306" in such a way...

- Reference character "16" of Fig 6 is missing in the specification translation.

Applicant emphasizes that Figure 6 clearly refers to Fig 1b. Reference to "virtual machine 16" is inserted on page 45, lines 13-14, as "16" is similarly described in reference to Fig. 1b on page 2, line 22.

Applicant submits that the objections to the drawings have been addressed and respectfully requests that the objections to the drawings be withdrawn.

SPECIFICATION

Applicant traverses the Examiner's various objections to the specification.

A substitute specification in proper idiomatic English as revised by the author of the original revised specification translation is provided (in both "Marked-Up" and "Clean" formats). No new matter has been added.

The substitute specification is based on a newly created translation (translation certification enclosed), revised to provide an improved translation in proper idiomatic English. In addition, the substitute specification has been amended, as indicated in accordance with 37 CFR 1.52(a) and (b).

Headings b), c), d), e) and l) on page 3 of the subject Office Action are not required / relevant with respect to the subject application.

Consequently, relevant headings a), f), g), h), i), j) and k) are introduced within the specification translation to comply with the Examiner's requirements.

In particular, the following headings have been added:

BACKGROUND OF THE INVENTION

Field of the invention

Prior Art

SUMMARY OF THE INVENTION

BRIEF DESCRIPTION OF THE DRAWINGS

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Embedded hyperlink references have been removed.

Trademarks have been capitalized throughout the specification translation.

With respect to minor errors in the specification translation or even clerical errors and translation errors, a careful checking has been performed so as to introduce the subsequent corrections throughout the specification.

Minor and clerical errors:

- Page 21 (marked up version), lines 6, 7, and 8:

The item "ε" which is obviously wrong is corrected to -ϵ- which clearly defines a symbol introducing the subtyping relationship of inheritance hierarchy between classes of the applet. See particularly the subtyping relation definition at page 21 from lines 15 to 19 (marked up version).

- Page 34, lines 18, the original mentioned relationship between I_i and AI_i is clearly erroneous. It is thus corrected to read:

$$I_i \leftrightarrow AI_i$$

in accordance with step 500 of figure 4b, in which the same relation is introduced.

- Page 35 at line 12, the question mark ("?") is clearly erroneous. With reference to step 501 at figure 4a, in which the same relationship between AE and I_i is quoted, the query mark is corrected to $\neq$.

- Page 38, line 11, the question mark ("?") is erroneous and corrected to $\neq$ as shown at step 504a of figure 5a.

- Page 38, line 22, the character 3 is corrected to $\exists$ the existence symbol with reference to step 504 of figure 5a.

Translation errors:

Some translation errors are now corrected, through out the specification and the drawings.

- The term "on-board" is clearly wrong.

With reference to page 1 relating to the prior art, the dummy "on-board" data-processing systems 10 clearly refers to an -embedded- data- processing systems, as known to any person of ordinary skill in the corresponding art.

Consequently, the term "on-board" of the verified translated specification is corrected to read —embedded- through out the description.

- The term "protocol" which might appear as misleading according to the Examiner's analysis is corrected to -process- all along the description.

- The title of the invention is corrected to read:

A METHOD FOR TRANSFORMING AND VERIFYING DOWNLOADED PROGRAM FRAGMENTS WITH DATA TYPE RESTRICTIONS AND CORRESPONDING SYSTEM.

An abstract of the disclosure is attached. A copy of the title page of the corresponding PCT international patent application WO 01/14958 is enclosed for the Examiner's consideration.

Applicant submits that the objections to the specification have been addressed and respectfully requests that the objections to the specification be withdrawn.

CLAIMS

Applicant respectfully traverses the Examiner's various objections to and rejections of the claims.

Claim Objections

Multidependency of the original claims has been canceled. The amended claims have been amended to comply with the Examiner's remarks.

The applicant believes that in most cases the lengthy preamble is necessary to explain the invention. Wherever appropriate, the preamble has been split up, as per claims 15, 16 and 22, in which the technical features of the standardized object code which is obtained by applying the method of transforming of the invention are now recited at the end of each corresponding claim. Amending these claims this way will not introduce any new matter, since the content of each claim is unchanged, while the standardized object code features are now highlighted as the result which is obtained thanks to the claimed method.

Original claims 1-3 have been canceled without prejudice.

Claim 4 is amended by canceling α, β, γ headings and introducing corresponding indentation.

Claims 5-6 are amended by canceling the symbols $\perp$ and $\top$. Amending claim 5 and 6 in this manner does not introduce new matter.

Underlining within the claims has been removed. Dashes to delineate steps and/or items are canceled. Bullets points within the claims have been removed.

Therefore, Applicant respectfully submits that the objections to claims 1-27 have been overcome.

<u>Claim Rejections</u>

Claims 1-3 and 23-25 have been rejected under 35 U.S.C. § 101 as claiming non-statutory subject matter. Claims 1 to 3 are canceled. Moreover, the specification is amended by correcting each occurrence of the item "protocol" to –process-, since, in accordance with the protocol general definition, a protocol is known to concern data exchange among given units, particularly corresponding exchange steps. Applicant thus believes that the exchange steps better correspond to a process.

Claims 23-25 are rejected because they are not limited to statutory computer readable media. Claim 23 has been canceled without prejudice. Although the computer programs which are the object of the invention are downloaded onto a reprogrammable embedded system, or a system, and thus stored therein, claims 24 and 25 have been amended to read "A computer program product which is recorded on a medium."

Therefore, Applicant respectfully submits that the rejections under 35 USC 101 directed to claims 1-3 and 23-25 have been overcome.

Claims 1-27 have been rejected under 35 U.S.C. § 112 first paragraph for failing to comply with the enablement and written description requirements. Although it is agreed that the original claims correspond to a literal translation as requested by the PCT regulation requirements to enter the national phase in the United States, Applicant has cancelled and/or amended the claims to provide clarity in the description, thereby enabling one of skill in the art to comprehend the Applicant's invention from the claims.

Regarding the Examiner's statement that "The phrase updating of the effect of said current instructions on the type stack the register table does not ensure that this takes place, thus making the claimed invention boarder than the written description," Applicant directs the Examiner to the substitute specification at page 18, lines 15-19. Though amended for clarity, this passage was present in the original specification at page 18, lines 30-37. Therefore, the specification does provide support for the quoted claim language. Additionally, independent claim 4 has been amended to reflect verification that the stack is empty. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

Regarding the Examiner's statement that the references to the "virtual machine" do not provide a sufficient description of the invention, the Examiner's attention is drawn to the specification translation from page 1, line 15 to page 3, line 7.

Applicant believes and asserts that using a virtual machine for interpreting applets within an embedded data-processing system is fully known to any person of ordinary skill in the corresponding art since 1996, as quoted with reference to the Tim LINDHOLM and Frank YELLIN publication at page 2, lines 18 to page 3, line 3 of the specification translation, while the documentation edited by SUN MICROSYSTEMS Inc. on the JAVACARD 2.1 Virtual Machine Specification was available to every body since March 1999, as quoted at the paragraph spanning pages 2 and 3 of the substitute specification. Accordingly, Applicant respectfully submits that the specification provides a clear description of a virtual machine for one of skill in the art and requests that this rejection be withdrawn.

Claims 1 to 27 are rejected under 35 USC 112 second paragraph as being generally narrative and indefinite, as well as for failing to define the invention. The claims have been amended to comply with the US practice and the Applicant respectfully requests that this rejection be withdrawn.

Claims 1-7, 15-19 and 26-27 are rejected under 35 USC 102(b) as unpatentable over U.S. patent 5,748,964 to Gosling.

Claims 4, 15, 16, 20, and 24-26 are independent. Claims 1-3, 7, 19, 21 and 23 have been cancelled without prejudice.

The present invention provides a novel solution for verification of program fragments, which is not described or disclosed by Gosling. Particularly, Applicant refers to the specification translation at page 5 from line 10 to page 6 line 3 in which the mode of operation of the system as disclosed by the U.S. patent 5,748,964 to Gosling is fully acknowledged and referred to as the third solution, known from the prior art.

Applicant also refers to the International Preliminary Examination Report (quoted below) as established by the International Preliminary Examination Authority and the official translation thereof, of which a copy is provided herewith.

The Examiner's attention should be drawn and made aware of that the object code verifier as disclosed by Gosling, referred to as D1, "has the disadvantage of a complex and costly static code verification process both in terms of the code size required to control the processor and in terms of the RAM memory size, as well as in terms of calculation time, with these memory requirements being far greater than the resource capacity of most existing embedded [on-board] computer systems."

In contradistinction to the prior art solution, the invention makes use of a method for "standardizing an original object code into a standardized object code with an empty stack branch instruction... using typed registers... Unlike the prior art methods, in which the stack type at every branch target must be stored in memory, the verification method of the present invention requires only the type of the execute stack during the instruction being verified and does not store the stack type in memory for other subprograms. As a result, the memory capacity requirement is reduced."

Thus, Applicant asserts that Gosling does not disclose the claimed invention. Accordingly, claims 4, 15, 16, 20, and 24-26 are not anticipated by Gosling. Claims 5, 6, 8-14, 17, 18, 21, 22 and 27 depend from, and add further limitation to, claims 4, 15, 16, 20, and 24-26. Accordingly, applicant respectfully asserts that claims 5, 6, 8-14, 17, 18, 21, 22 and 27 are not anticipated by Gosling and all of the claims are in condition for allowance.

CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or

concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Please charge the requisite petition fee in the amount of $1,500 (pursuant to 37 C.F.R. § 1.17(m)) to Deposit Account 50-2324. Additionally, Petitioner conditionally petitions for an extension of time to provide for the possibility that the need for such a petition has been inadvertently overlooked. As provided below, please charge Deposit Account No. 50-2324 for any required fee, or for any deficiency in the enclosed fee.

In the event that the Patent Office believes that additional fees are required to be submitted with this petition, please charge any fee(s) or credit overpayments to Deposit Account 50-2324. While the Petitioner believes that this Petition is in order, the Director is invited to telephone applicants' attorney (@ 617-305-2143) to facilitate prosecution of this matter.

Respectfully submitted,

Date: __11 JUNE 2007__
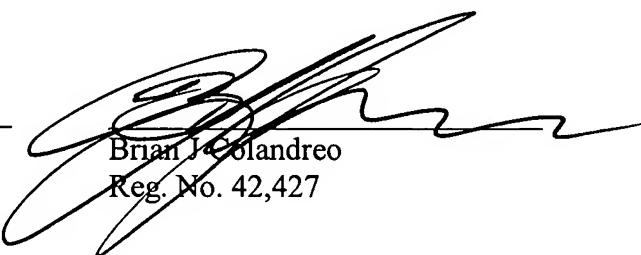
Brian J. Colandreo
Reg. No. 42,427

Holland & Knight LLP
10 St. James Avenue
Boston, MA 02116
Telephone: (617) 573-5850
Facsimile: (617) 523-6850

4516487_v1

ABSTRACT OF THE DISCLOSURE

A method and system for transforming and verifying downloaded programs fragments with data type restriction in an embedded system in which a program fragment being temporarily stored a verification process of the stored program fragment object code is executed instruction by instruction so as to discriminate for each instruction the existence of a target, a branching instruction target, a target of an exception handler call or a target of a subroutine call. On the occurrence of a target of a branching instruction as the current instruction, the empty status of the stack is verified and the program fragment is rejected otherwise. A verification process and updating of the effect of the current instruction on the data types of the type stack and the table of register types is performed. The verification process is successfully executed instruction by instruction until the table of register types is stable, with no modification being present, and interrupted with the program fragment being rejected otherwise.

(54) Title: MANAGEMENT PROTOCOL, METHOD FOR VERIFYING AND TRANSFORMING A DOWNLOADED PROGRAMME FRAGMENT AND CORRESPONDING SYSTEMS

(54) Titre: PROTOCOLE DE GESTION, PROCEDE DE VERIFICATION ET DE TRANSFORMATION D'UN FRAGMENT DE PROGRAMME TELECHARGE ET SYSTEMES CORRESPONDANTS
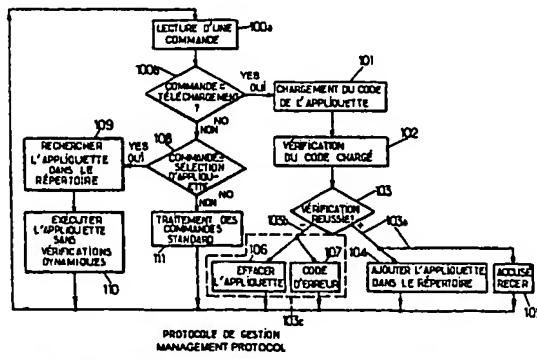
PROTOCOLE DE GESTION
MANAGEMENT PROTOCOL

109...SEARCH FOR APPLET IN REPERTOIRE
110...EXECUTE APPLET WITHOUT DYNAMIC CHECKS
100a...COMMAND READ
100b...COMMAND = DOWNLOAD ?
108...COMMAND = SELECTION OF APPLET
111...STANDARD COMMAND PROCESSING
101...APPLET CODE DOWNLOADED
102...DOWNLOADED CODE VERIFIED
103...VERIFICATION SUCCESSFULL ?
104...DELETE APPLET
107...ERROR CODE
104...ADD APPLET TO REPERTOIRE
105...RECEIVE ACKNOWLEDGEMENT

(57) Abstract: The invention relates to a management protocol and to a method for verifying a programme fragment, or applet, which has been downloaded onto a portable system. An applet downloading command (100a, 100b) is executed. Once a positive response has been received, the object code of the applet is read (101) and subjected (102) to a verification process, instruction by instruction. The verification process consists of a stage comprising the initialisation of the type stack and table of register types representing the state of the virtual machine of the portable system at the start of the execution of the applet code; and a verification, instruction by instruction, for each target current instruction, of the existence of a target branch instruction, a target exception handler call or a target sub-routine call, the effect of the instruction on the type stack and the table of register types being verified and updated. If the verification is successful (103a), the applet is registered (104) and an acknowledgement is sent (105) to the downloading drive. Otherwise, the applet is destroyed (106). The invention is suitable for use for portable systems in a Java environment.

[Suite sur la page suivante]

WO 01/14958 A2

TRANSLATION CERTIFICATION

RWS Group Ltd, of Europa House, Marsham Way, Gerrards Cross, Buckinghamshire, England, hereby declares that, to the best of its knowledge and belief, the following document, prepared by one of its translators competent in the art and conversant with the English and French languages, is a true and correct translation of the accompanying document in the French language.

Signed this 4th day of August 2005

C. E. SITCH

Deputy Managing Director - UK Translation Division

For and on behalf of RWS Group Ltd

TRAITE DE COOPERATION EN MATIERE DE BREVETS

Expéditeur: le BUREAU INTERNATIONAL

PCT

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(règle 72.2 du PCT)

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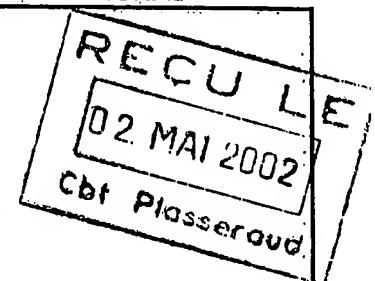
Date d'expédition (jour/mois/année) 16 avril 2002 (16.04.02)	
Référence du dossier du déposant ou du mandataire BCT000077	**NOTIFICATION IMPORTANTE**
Demande internationale no PCT/FR00/02349	Date du dépôt international (jour/mois/année) 21 août 2000 (21.08.00)
Déposant TRUSTED LOGIC etc	

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Il appartient au déposant d'établir la traduction en question et de la remettre directement à chaque office élu intéressé (règle 74.1). Voir le volume II du Guide du déposant du PCT pour de plus amples renseignements.

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Formulaire PCT/IB/338 (juillet 1996)

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BCT000077	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. .PCT/FR00/02349	International filing date *(day/month/year)* 21 August 2000 (21.08.00)	Priority date *(day/month/year)* 23 August 1999 (23.08.99)
International Patent Classification (IPC) or national classification and IPC G06F 9/445		
Applicant TRUSTED LOGIC		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of _____5_____ sheets, including this cover sheet.

    ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

    These annexes consist of a total of _____. sheets.

3. This report contains indications relating to the following items:

    I   ☒ Basis of the report

    II ☐ Priority

    III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

    IV ☐ Lack of unity of invention

    V   ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

    VI ☐ Certain documents cited

    VII ☐ Certain defects in the international application

    VIII ☒ Certain observations on the international application

Date of submission of the demand 20 March 2001 (20.03.01)	Date of completion of this report 20 November 2001 (20.11.2001)
Name and mailing address of the IPEA/EP Facsimile No. —	Authorized officer Telephone No.

Form PCT/IPEA/409 (cover sheet) (January 1994)

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages _____1-68_____ , as originally filed,

pages _____ , filed with the demand,

pages _____ , filed with the letter of _____ ,

pages _____ , filed with the letter of _____ .

☒ the claims, Nos. _____1-27_____ , as originally filed,

Nos. _____ , as amended under Article 19,

Nos. _____ , filed with the demand,

Nos. _____ , filed with the letter of _____ ,

Nos. _____ , filed with the letter of _____ .

☒ the drawings, sheets/fig _____1-14_____ , as originally filed,

sheets/fig _____ , filed with the demand,

sheets/fig _____ , filed with the letter of _____ ,

sheets/fig _____ , filed with the letter of _____ .

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-27		YES
	Claims			NO
Inventive step (IS)	Claims	1-27		YES
	Claims			NO
Industrial applicability (IA)	Claims	1-27		YES
	Claims			NO

2. Citations and explanations

1. Reference is made to the following document:

   D1: US-A-5 748 964

2. The present invention relates to a method for converting a conventional object code constituting an applet for execution by an on-board computer system having limited resources.

   Prior art:

   The download of an applet to an on-board computer system is subject to authenticity verification. D1 discloses static verification simulating the execution of the applet with data types and ensures, once and for all, that the applet code complies with the data type and access control rules set by the virtual machine and that it does not cause stack overflow.

   Problem:

   This solution has the disadvantage of a complex and costly static code verification process both in

terms of the code size required to control the
processor and in terms of the RAM memory size
required to contain the intermediate verification
results, as well as in terms of the calculation
time. These memory requirements are far greater than
the resource capacity of most existing on-board
computer systems.

Solution:

The present invention uses a process for
standardising an original object code into a
standardised object code with an empty stack branch
instruction and a standardised code using typed
registers such that any one register is used under a
single type throughout the subprogram code. Unlike
the prior art methods, in which the stack type at
every branch target must be stored in memory, the
verification method of the present invention
requires only the type of the execute stack during
the instruction being verified and does not store
the stack type in memory for other subprograms. As a
result, the memory capacity requirement is reduced.

3. The dependent claims relate to specific embodiments
    of the invention according to the independent
    claims. Therefore, they too comply with the
    requirements of novelty, inventive step and
    industrial applicability.

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR 00/02349

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

It is clear from page 38 of the description that the feature whereby the stack must be empty for each branch or branch target instruction, and/or all of the registers are reset when the method is initialised, is essential for the definition of the invention. Indeed, the phrase "updating of the effect of said current instruction on the type stack and the register type table" in no way means that conditions C3 and C4 (page 38), which are fundamental to the present invention, have been met.

Since the independent claims do not contain these features, they fail to comply with the requirements of PCT Article 6 in combination with PCT Rule 6.3(b), according to which an independent claim must contain all of the technical features essential for the definition of the invention. Therefore, the independent claims do not meet the requirements of PCT Article 6.